

Data Sharing Activities of the Susquehanna River Basin Commission

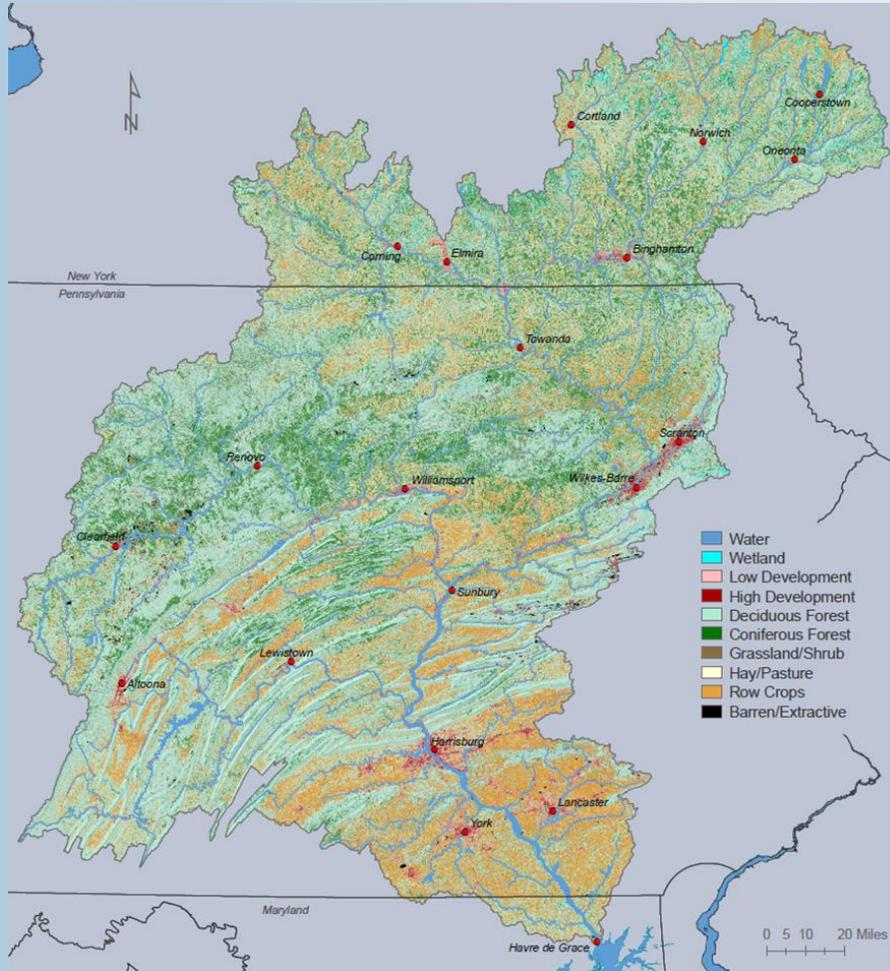
**ACWI--Streamflow Information Collaborative
Tuesday, September 10, 2019**

Susquehanna River Basin Commission (SRBC)

- SRBC is a federal-interstate compact commission established in 1971 by the federal government and the states of NY, PA, MD.
- SRBC is responsible for managing the basin's water resources and advancing public information on water resources.



Susquehanna River Basin



The Basin

- 27,510-square-mile watershed
- Comprises 43% of the Chesapeake Bay Watershed
- Diverse landscape; 60% forested
- 49,000+ miles of waterways
- Population of 4.2 million

The Susquehanna River

- 444 miles, largest tributary to the Chesapeake Bay
- Supplies 18 million gallons per minute to the bay
- Supports Public Water Supply, Industry and Ecosystem

SRBC Programs and Data Needs

- Regulation of water withdrawals and the consumptive use of water
 - quantity and location of water sources and usage; permit conditions
- Water quality monitoring, assessment and restoration
 - water chemistry, aquatic biology, sources and level of impairments
- Flood and drought monitoring and preparedness
 - hydrologic conditions
- Planning and watershed management
 - all of the above

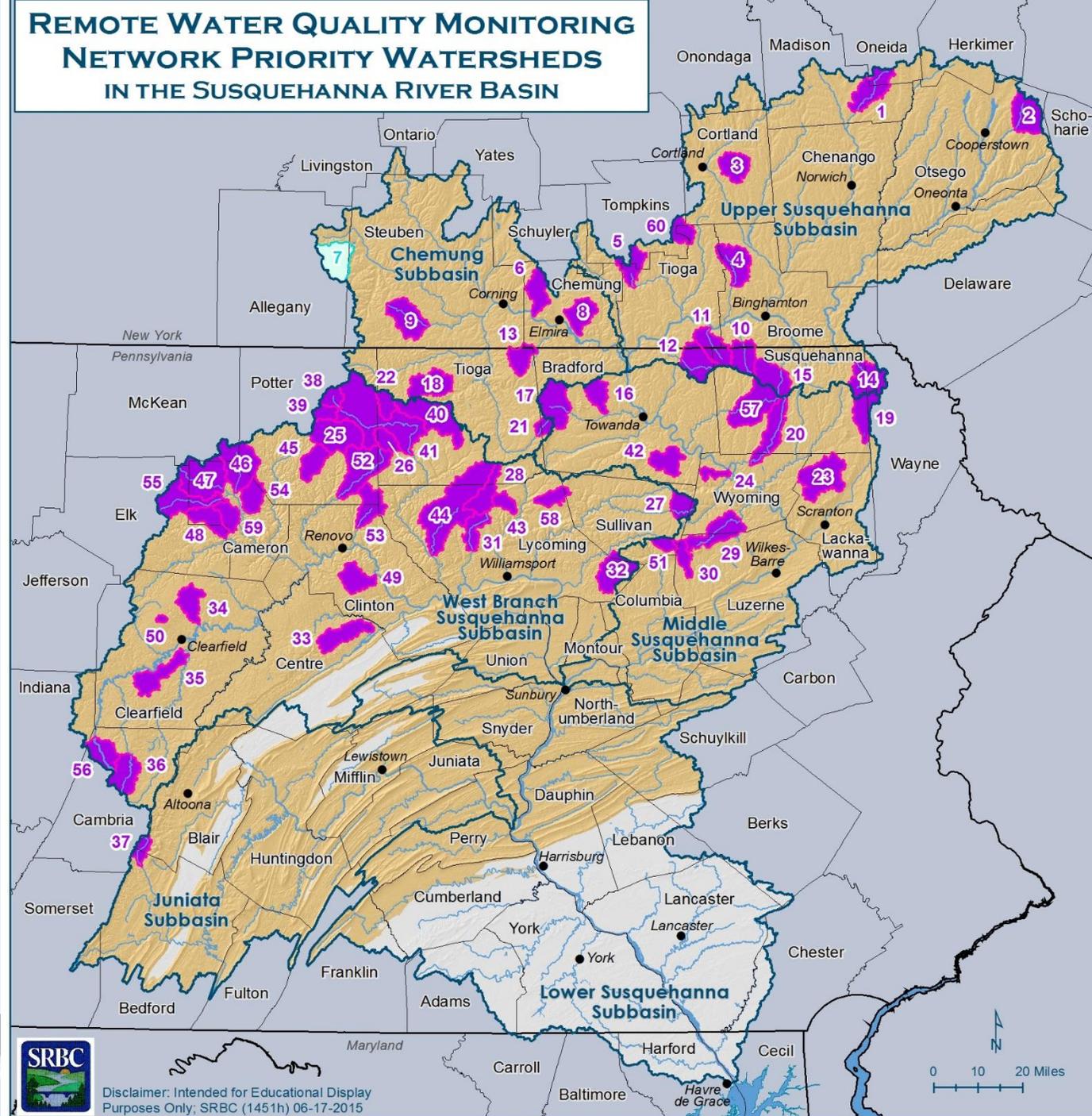
SRBC Data Collection, Management and Access

- Collect data directly
- Gather data from member agencies and partners
- Require permittees to collect and report data
- Database developer, database analyst on staff
- Software and training
- Access to records policy
- Public portals

Continuous Water Chemistry Monitoring Network

- Initiated in 2010
 - approximately 60 stations in northern PA and southern NY
- Initial purpose to track water quality and assess for impacts of increased natural gas extraction activity
 - Establish baseline water quality conditions;
 - Form collaborative partnerships to improve monitoring technology and provide educational opportunities;
 - Enhance protection for water supplies; and
 - Be responsive to public concerns.

REMOTE WATER QUALITY MONITORING NETWORK PRIORITY WATERSHEDS IN THE SUSQUEHANNA RIVER BASIN



- Area Containing Natural Gas Shales
- Area with No Recoverable Natural Gas Formations

Recoverable Natural Gas Shales within the Susquehanna River Basin include the Marcellus, Burket, Utica/Antes, Geneseo, Mandata, Middlesex, Needmore, and Rhinestreet Formations.

PRIORITY WATERSHEDS

Station Installed

- | | |
|------------------------------------|--|
| 1. Sangerfield River | 32. Little Muncy Creek |
| 2. Cherry Valley Creek | 33. Marsh Creek |
| 3. Trout Brook | 34. Trout Run |
| 4. Nanticoke Creek | 35. Little Clearfield Creek |
| 5. Catatunk Creek | 36. Chest Creek |
| 6. Sing Sing Creek | 37. Bobs Creek |
| 8. Baldwin Creek | 38. Upper Pine Creek |
| 9. Tuscarora Creek | 39. Ninemile Run |
| 10. Choconut Creek | 40. Marsh Creek |
| 11. Apalachin Creek | 41. Pine Creek |
| 12. Wappasening Creek | 42. Sugar Run |
| 13. Hammond Creek | 43. Grays Run |
| 14. Starrucca Creek | 44. Little Pine Creek |
| 15. Snake Creek | 45. East Fork First Fork Sinnemahoning Creek |
| 16. Tomjack Creek | 46. Portage Creek |
| 17. Sugar Creek | 47. Driftwood Branch |
| 18. Crooked Creek | 48. Hicks Run |
| 19. Lackawanna River | 49. Baker Run |
| 20. Meshoppen Creek | 50. Moose Creek |
| 21. Tioga River | 51. East Branch Fishing Creek |
| 22. Long Run | 52. Kettle Creek |
| 23. South Branch Tunkhannock Creek | 53. Young Womans Creek |
| 24. Little Mehoopany Creek | 54. Hunts Run |
| 25. West Branch Pine Creek | 55. West Creek |
| 26. Elk Run | 56. West Branch Susquehanna River |
| 27. Loyalsock Creek | 57. East Branch Wyalusing Creek |
| 28. Blockhouse Creek | 58. Pleasant Stream |
| 29. Bowman Creek | 59. Sterling Run |
| 30. Kitchen Creek | 60. West Branch Owego Creek |
| 31. Larrys Creek | |

Historical Station

- 7. Canacadea Creek



Disclaimer: Intended for Educational Display Purposes Only; SRBC (1451h) 06-17-2015



Continuous Data

- Parameters monitored: pH, temperature, specific conductance, dissolved oxygen, and turbidity
- Collected at 15-minute intervals
- Transmitted to a public website at 4 hour interval
- Posted as provisional data

<u>Monitoring Station</u>	<u>Temperature (C)</u>	<u>Specific Conductivity (mS/cm)</u>	<u>pH</u>	<u>Turbidity (NTU+)</u>	<u>ODO (mg/L)</u>
Baker Run <i>(8/5/2019 8:00:00 AM)</i>	15.6	0.039	6.34	0.4	9.82
Baldwin Creek <i>(8/5/2019 12:00:00 PM)</i>	20.99	0.223	7.77	3.68	9.85
Baldwin Run, Tioga Cty. <i>(8/5/2019 11:00:00 AM)</i>	16.46	0.096	7.53	11	9.31
Blockhouse Creek <i>(8/5/2019 12:00:00 PM)</i>	20.35	0.136	8.34	3.96	9.59
Bobs Creek <i>(8/5/2019 8:00:00 AM)</i>	17.2	0.083	7.21	4.7	9.21
Bowman Creek <i>(8/5/2019 12:15:00 PM)</i>	19.8	0.045	7.02	2.35	9.58
Butternut Creek <i>(8/5/2019 8:00:00 AM)</i>	11.38	0	6.95	2.9	10.47

Other Monitoring

- Site visits – 10-12 weeks for O&M
 - More frequent if warranted
 - “Alarms” are sent via email to staff to alert them of potential problems or malfunctions
- Quarterly sampling for metals, nutrients, and ions
- Annual macroinvertebrate sampling
- Fish surveys



Continuous WQ Data Web Portal

SUSQUEHANNA RIVER BASIN COMMISSION
Protecting Your Watershed for Today and Tomorrow

REMOTE WATER QUALITY MONITORING NETWORK

Real-Time Data and Maps | Data Reports | Overview | Objectives | SRBC Home

Fact Sheet | Monitoring Parameters | Watershed Profiles | Methods | FAQs | Partners | Report | Data Limitation/Disclaimer

Overview

The Commission initiated the Remote Water Quality Monitoring Network (Network) in January 2010. The Network continuously measures and reports water quality conditions of smaller rivers and streams located throughout the Basin. The data help the Commission track existing water quality conditions and any changes on an ongoing, real-time basis.

The Network initially monitored streams in areas where natural gas development is active or could potentially become active. Recently, the Network has expanded to cover PA and NY to monitor general water quality conditions.

The Network provides constant data collection with instruments sensitive enough to detect subtle changes in water quality on a frequency that will allow background conditions and any changes to them to be documented throughout the year. The following five water quality parameters are being measured at each station:

- Temperature
- pH – the measure of acidity or alkalinity, with normal ranges between 6 and 9
- Conductance – the ability of the water to conduct electricity, which typically reflects the amount of dissolved solids or chlorides in the water
- Dissolved oxygen – amount of oxygen in the water available to aquatic life, with levels best above 4-5 mg/L

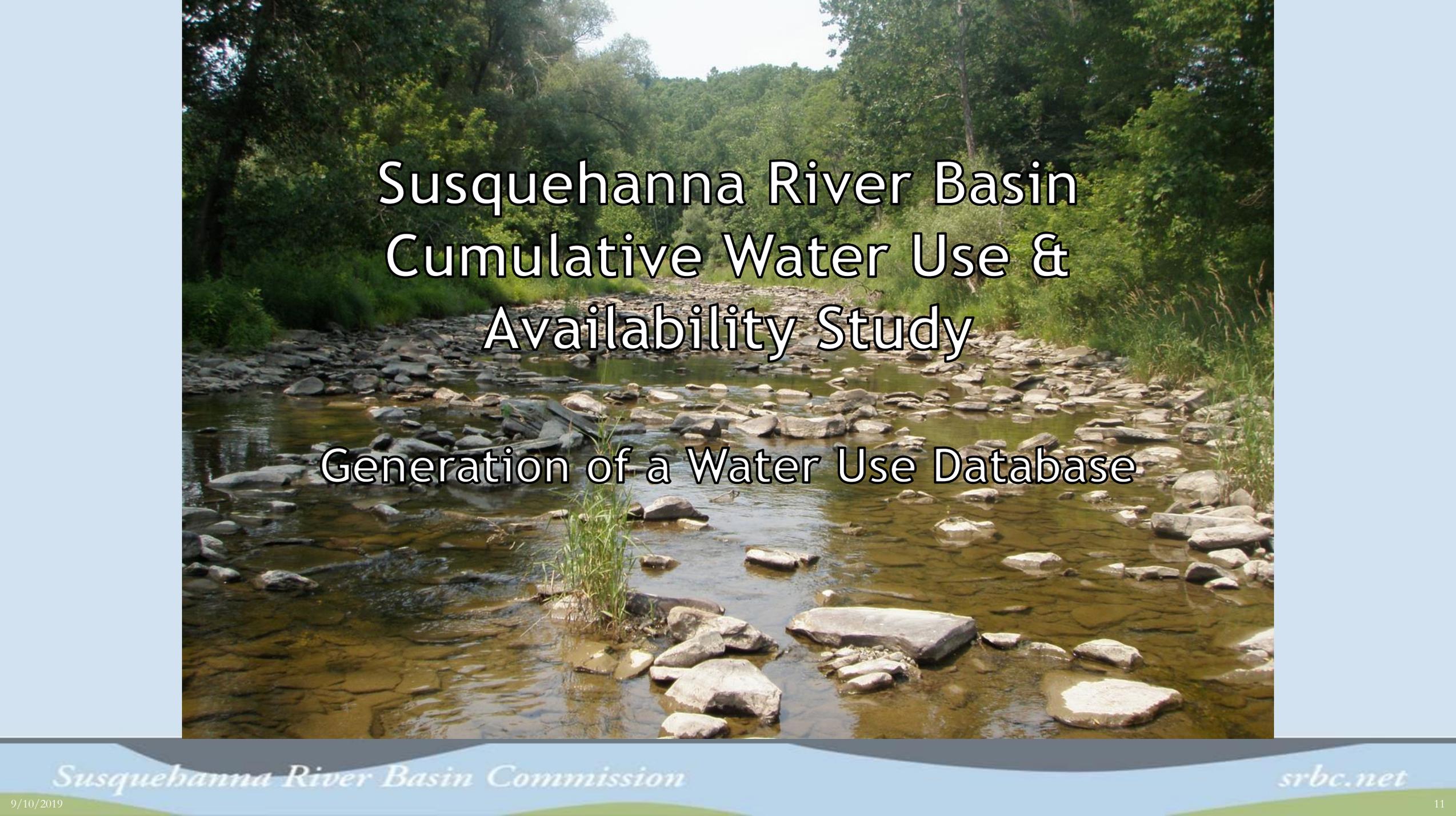
Contact Us



Remote Water Quality Monitoring Network - Real-Time Data and Maps

Recent Results | Graphs | Statistics | Raw Data | Map | Quarterly Data Downloads

Monitoring Station	Temperature (C)	Specific Conductivity (mS/cm)	pH	Turbidity (NTU+)	ODO (mg/L)
Baker Run (9/10/2019 4:00:00 AM)	13.52	0.045	6.42	0	10.27
Baldwin Creek (9/10/2019 8:15:00 AM)	15.36	0.22	7.24	2.68	8.09
Baldwin Run, Tioga Cty. (9/8/2019 9:45:00 PM)	14.51	0.103	7.44	7.73	9.49
Blockhouse Creek (9/10/2019 8:15:00 AM)	14.97	0.148	7.95	1.83	9.85
Bobs Creek (9/10/2019 4:00:00 AM)	14.52	0.09	7.29	3.8	9.85
Bowman Creek (9/10/2019 8:15:00 AM)	15.11	0.056	6.91	2.15	9.83
Butternut Creek (9/10/2019 4:00:00 AM)	16.42	0.181	7.09	5.2	8.67
Catatonk Creek (9/10/2019 8:15:00 AM)	14.24	0.42	7.72	3.4	7
Cherry Valley Creek (9/10/2019 4:00:00 AM)	15.47	0.269	7.56	16.8	8.48
Chest Creek (9/10/2019 8:15:00 AM)	15.99	0.272	7.1	8.8	9.02

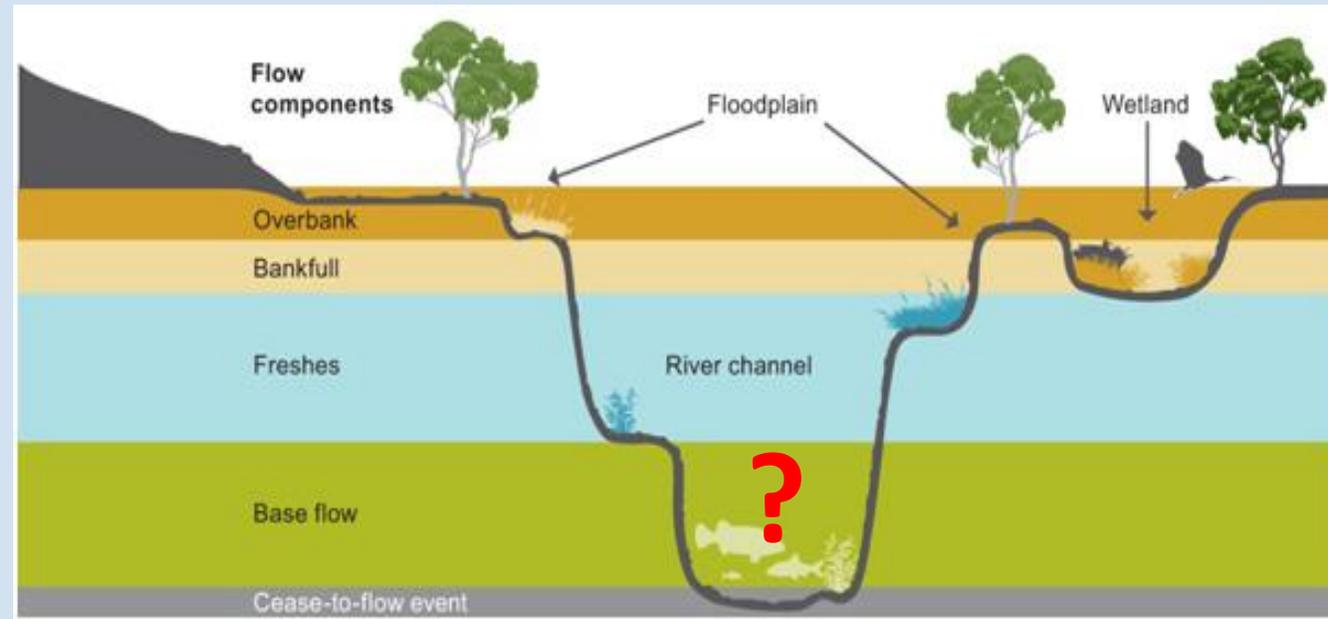


Susquehanna River Basin Cumulative Water Use & Availability Study

Generation of a Water Use Database

Purpose & Scope

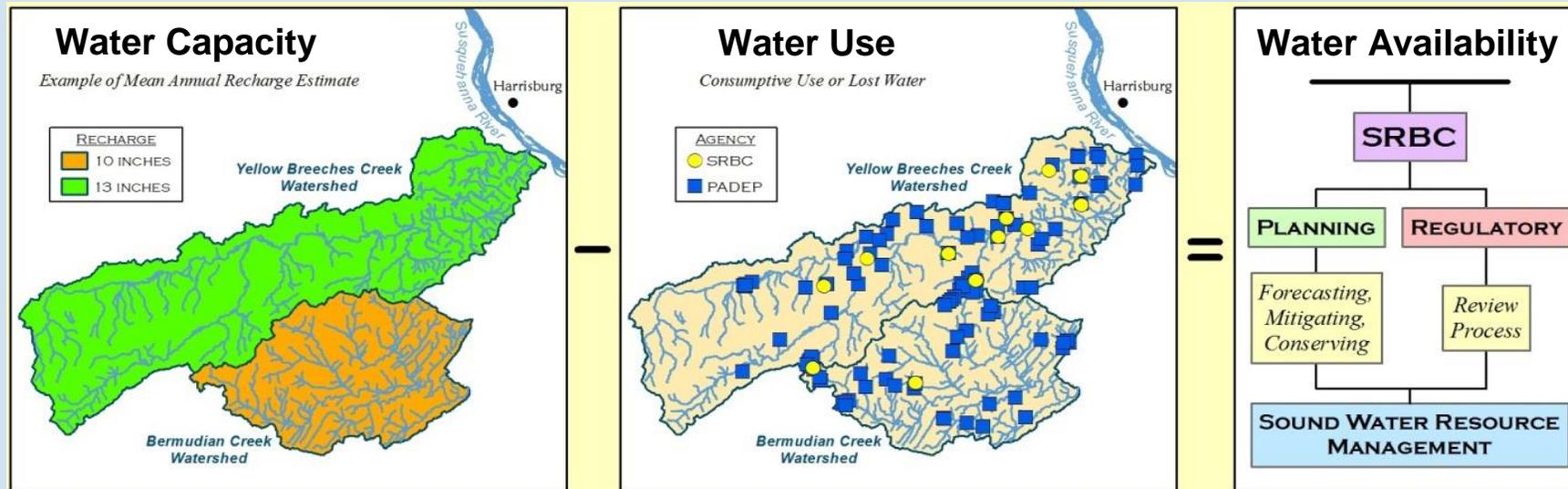
Comprehensively evaluate cumulative **water use**, determine **water capacity** sustainably available, and assess resultant **water availability** for Basin watersheds to inform planning and regulatory decision making

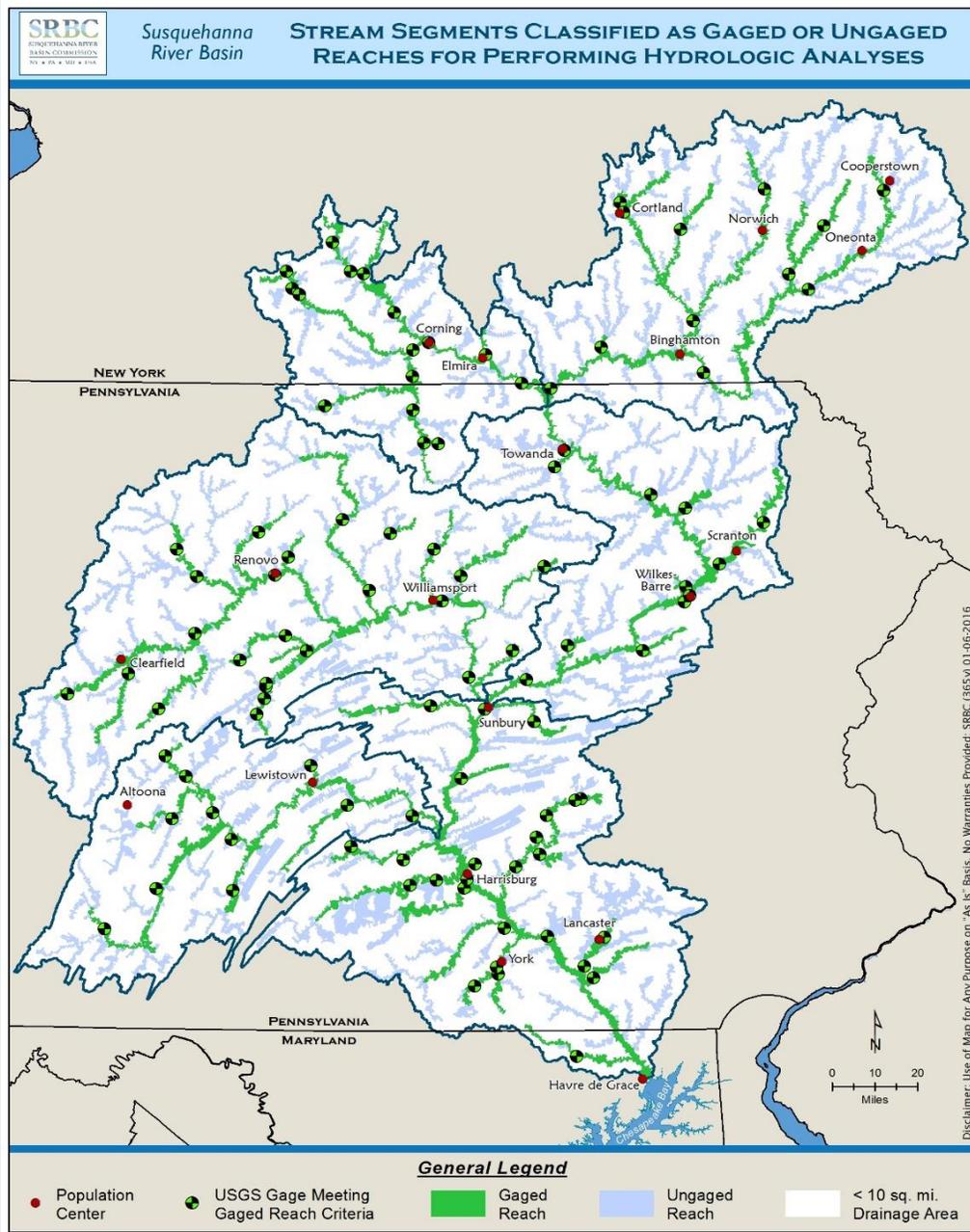


(Modified from Murray-Darling Basin Authority, 2011)

Defining Water Availability

Water Capacity – Water Use (CU) = Water Availability

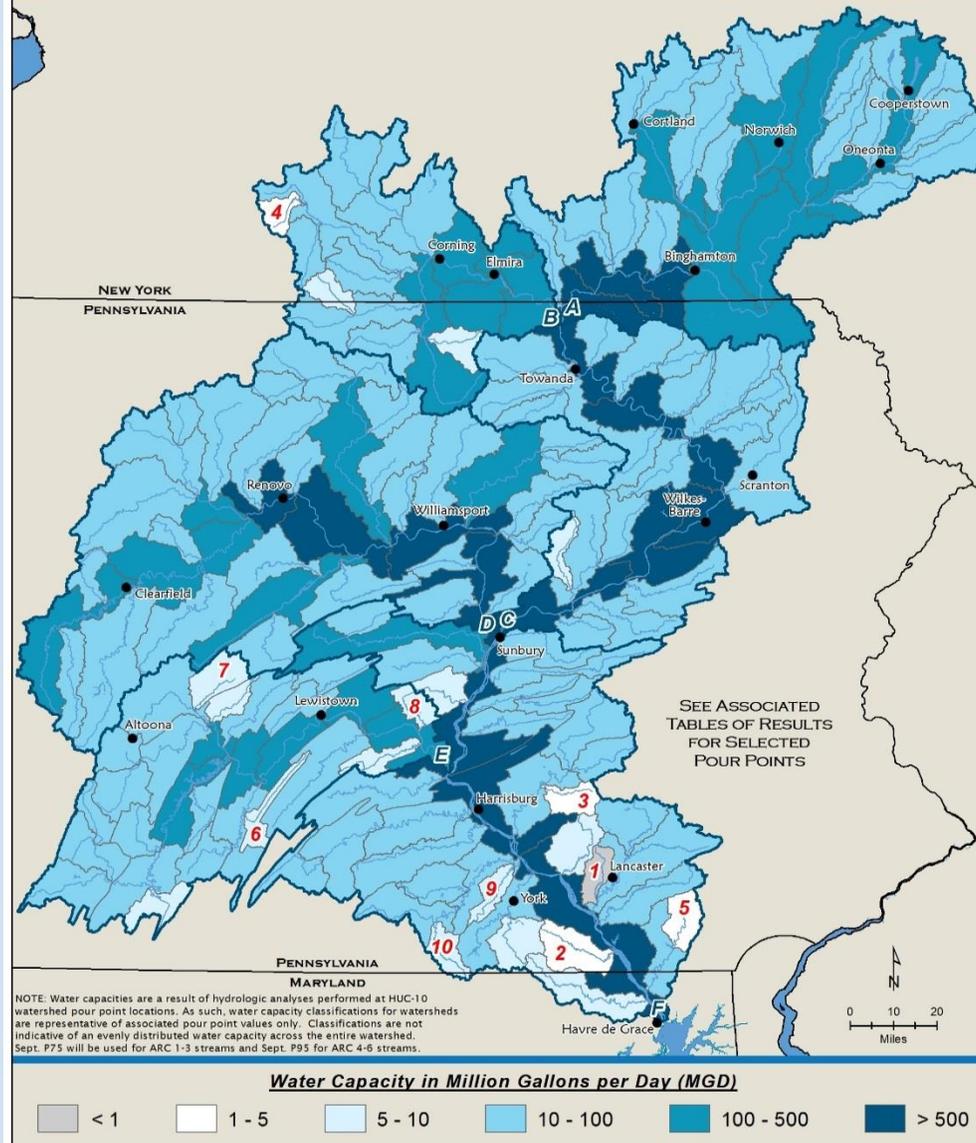




Water Capacity: Hydrologic Analysis

- Leverage gage network to extent reasonable
- Use regression equations for ungaged reaches
- Based on 10-year baseflow
- Analysis limited to watersheds >10 mi²

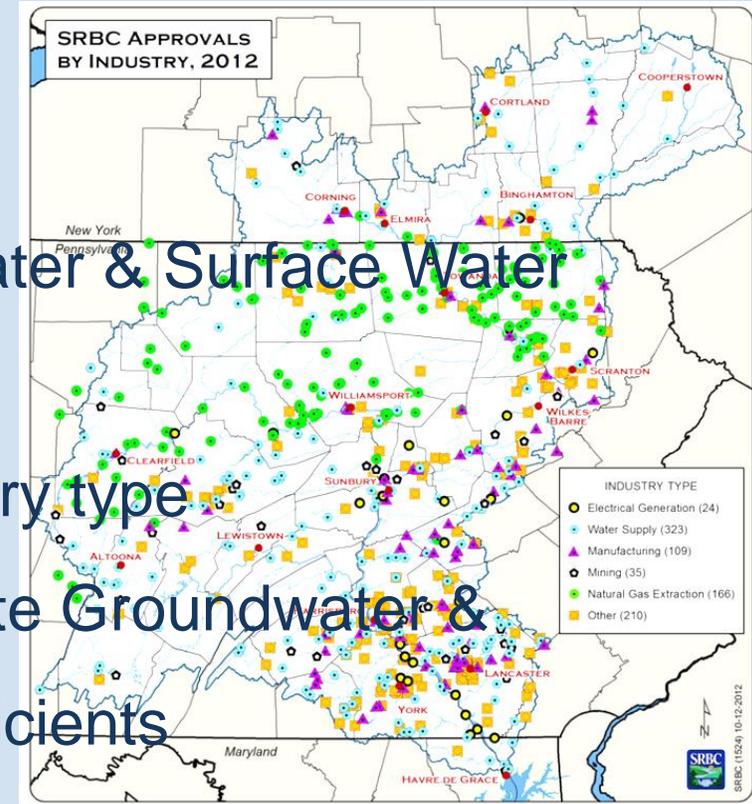
WATER CAPACITY EXPRESSED AS 50 PERCENT OF 10-YEAR BASEFLOW MINUS SEPTEMBER P75/P95 FLOW BY HUC-10 WATERSHED IN THE SUSQUEHANNA RIVER BASIN



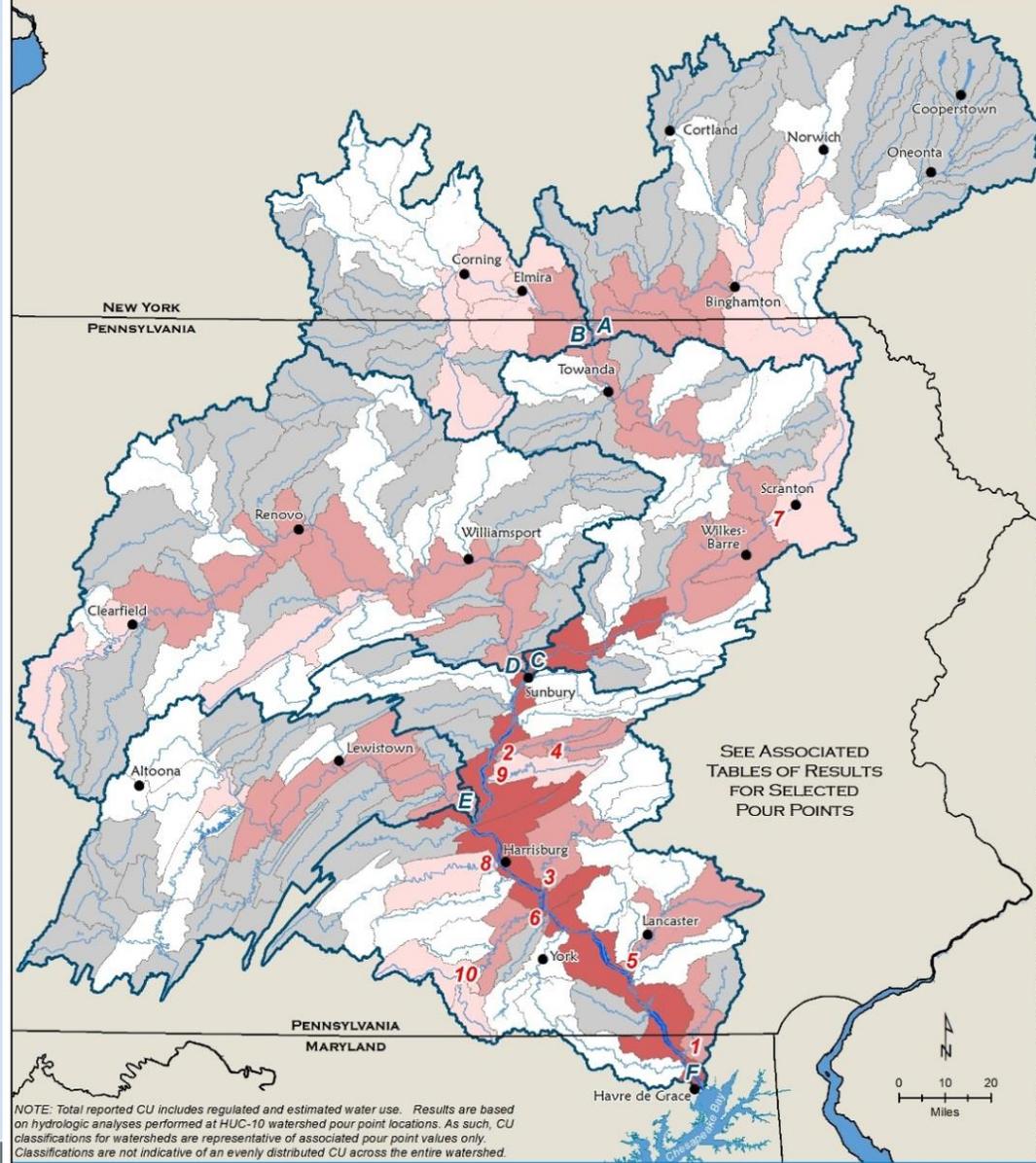
Water Use: Database Compilation

Consumptive Use Approach

- Based on SRBC CU approvals
- Supplemented by SRBC Groundwater & Surface Water approvals using CU coefficients
 - CU coefficients based on industry type
- Also supplemented by member state Groundwater & Surface Water data using CU coefficients
 - permitted and registered
- Estimated unregulated CU



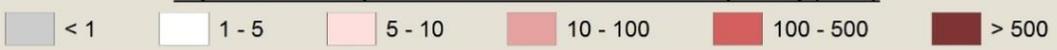
TOTAL 2014 REPORTED CONSUMPTIVE USE
BY HUC-10 WATERSHED IN THE SUSQUEHANNA RIVER BASIN



SEE ASSOCIATED
TABLES OF RESULTS
FOR SELECTED
POUR POINTS

NOTE: Total reported CU includes regulated and estimated water use. Results are based on hydrologic analyses performed at HUC-10 watershed pour point locations. As such, CU classifications for watersheds are representative of associated pour point values only. Classifications are not indicative of an evenly distributed CU across the entire watershed.

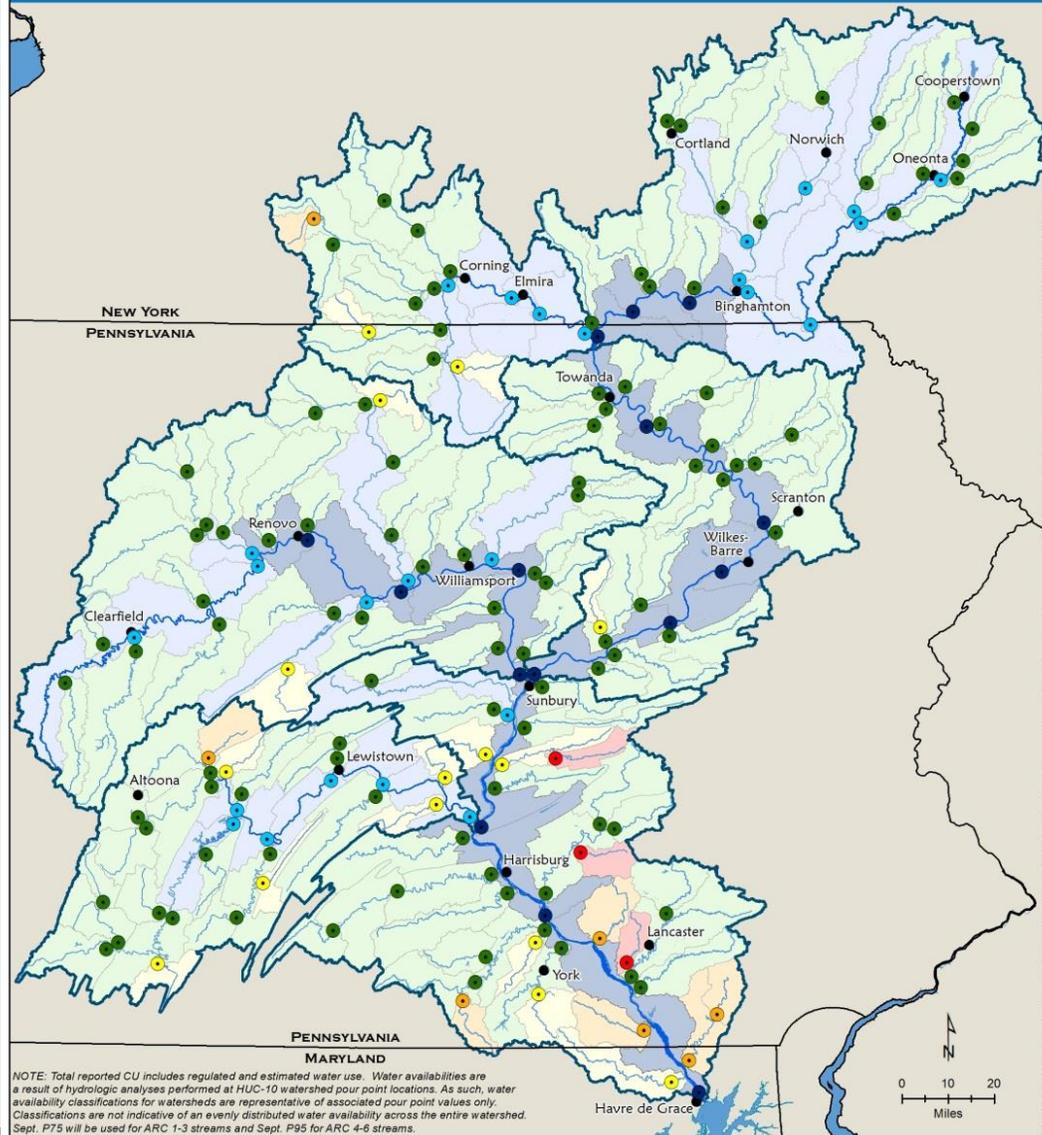
Reported Consumptive Water Use in Million Gallons per Day (MGD)



SOURCE: Water Use, PADEP, NYSDOH, NYSDEC, MDE. Disclaimer: Use of Map for Any Purpose on "As Is" Basis. No Warranties Provided. SRBC (3650) 01.06-2016



WATER AVAILABILITY EXPRESSED AS 50% OF 10-YEAR BASEFLOW MINUS SEPTEMBER P75/P95 FLOW MINUS TOTAL 2014 REPORTED CONSUMPTIVE USE FOR HUC-10 WATERSHEDS IN THE SUSQUEHANNA RIVER BASIN



NOTE: Total reported CU includes regulated and estimated water use. Water availabilities are a result of hydrologic analyses performed at HUC-10 watershed pour point locations. As such, water availability classifications for watersheds are representative of associated pour point values only. Classifications are not indicative of an evenly distributed water availability across the entire watershed. Sept. P75 will be used for ARC 1-3 streams and Sept. P95 for ARC 4-6 streams.

SOURCE: Water Use: SRBC, PADEP, NYSDOH, NYSDAC, MDE. Disclaimer: Use of Map for Any Purpose on "As Is" Basis. No Warranties Provided. SRBC, (365k) 07-06-2016

Water Availability in Million Gallons per Day (MGD)

- < 0
- 0 - 5
- 5 - 10
- 10 - 100
- 100 - 500
- > 500

Products

1. Technical report
 - With executive summary
2. Interactive GIS-based assessment tool
 - For Commission staff and member jurisdictions
3. Interactive web map
 - For projects, consultants, NGOs, academia, and the public

Cumulative Water Use & Availability Study (CWUAS)

CWUAS Tool

The Cumulative Water Use and Availability Study (CWUAS) Tool provides a series of analytical components that automate the quantification of water use, capacity, and availability at user input pour point locations throughout the Susquehanna River Basin. Water availability is defined as water capacity minus consumptive use within the watershed upstream of a pour point. The Tool will assist in both identifying watersheds with existing and/or projected water availability concerns and evaluating management alternatives to mitigate impacts of cumulative consumptive use within the Basin.

[Visit the CWUAS Study Page >](#)

References	Announcements
User Manual	Last Update 10/08/15
Technical Report	Version: Beta
Technical Report Appendices	Release Notes
Glossary	

Cumulative Water Use & Availability Study for the Susquehanna River Basin

How to use the map

Water Use, Capacity, or Availability

Approved Consumptive Use (mgd)

Reported Consumptive Use (mgd)

Water Capacity (mgd)

Water Availability (Approved) (mgd)

Water Availability (Reported) (mgd)

Water Availability (Approved) (mgd) Legend:

- <0
- 0-5
- 5-10
- 10-100
- 100-500
- >500

Water Availability (Reported) (mgd)

Select by Subbasin then Watershed

Subbasin: Please select a subbasin

HUC-10 Watershed: Please select a HUC-10 watershed

[Clear Selection](#)

Reference Layers

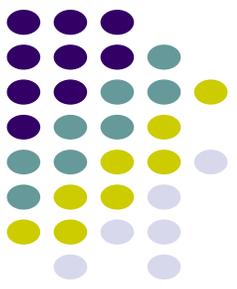
Population Center

River / Stream

County Boundary

Cumulative Water Use & Availability Study
CWUAS@srbc.net

SRBC SUSQUEHANNA RIVER BASIN COMMISSION
4423 N. Front Street
Harrisburg, PA 17110-1788



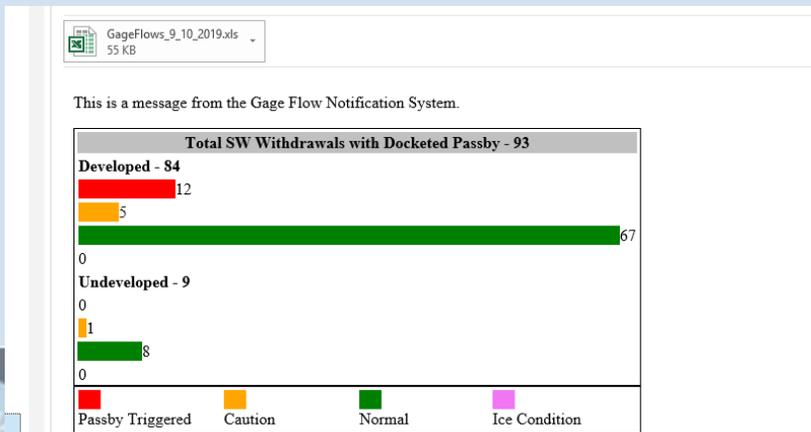
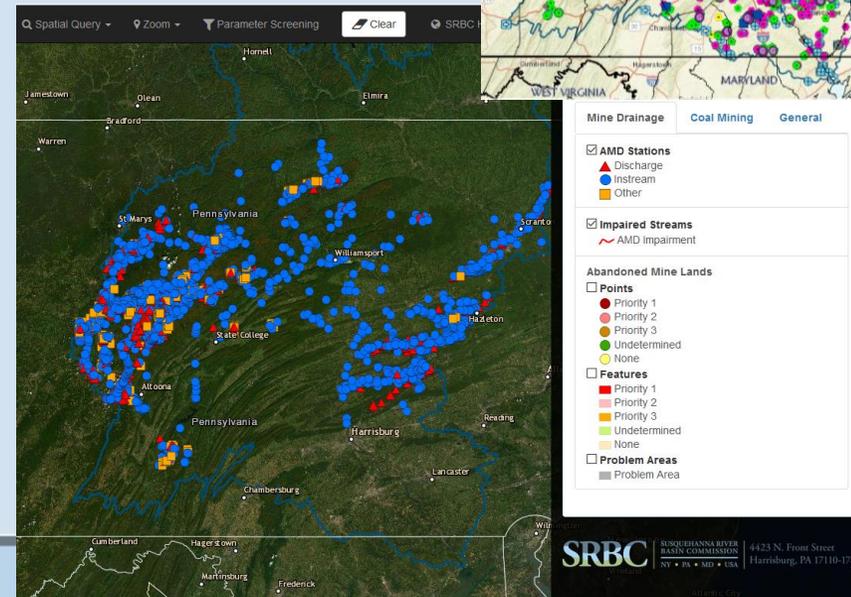
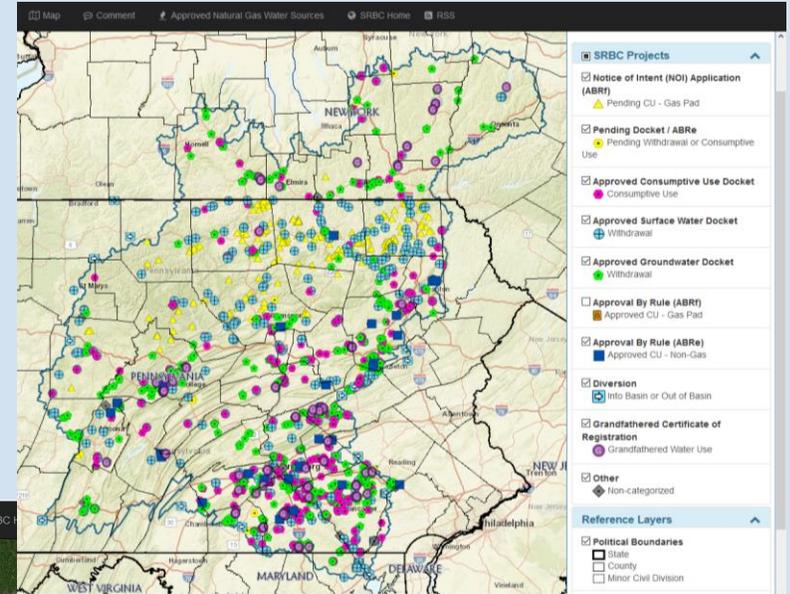
Challenges

Water Use Database Compilation

- Monthly reporting is available but not provided
- Return or discharge data was incomplete or not readily available from member states
- Varying thresholds for registration/permitting/reporting
- Monthly vs Annual; monthly vs 30-day
- IT and security hurdles
- Updates

Other Data Sharing Initiatives

- Water Application and Approval Viewer
- Mine Drainage Portal
- Agreements with member agencies
- Hydrologic conditions portal (under development)



Contact Information

- Andrew Dehoff, Executive Director
 - adehoff@srbc.net
 - Ext. 1221
- John Balay, Manager of Planning and Operations
 - jbalay@srbc.net
 - Ext. 1217
- 4423 N. Front St., Harrisburg, PA 17110
- 717-238-0423

